

What is claimed is:

1. A method of manufacturing a device comprising the steps of: a) disposing a sacrificial material layer on a device substrate; b) disposing an overlayer material on the sacrificial material layer; and then c) removing the sacrificial material layer to form an air gap; wherein the sacrificial material layer comprises a cross-linked polymer.
2. The method of claim 1 wherein the overlayer material is an organic polysilica material.
3. The method of claim 1 wherein the sacrificial material comprises as-polymerized units of one or more methacrylate-containing monomers or methacrylate-containing cross-linking agents.
4. The method of claim 1 wherein the device is an electronic or optoelectronic device.
5. The method of claim 1 wherein the sacrificial material is photoimageable.
6. The method of claim 1 wherein the device substrate comprises metal lines.
7. The method of claim 1 wherein the sacrificial material comprises one or more reactive functional groups selected from the group consisting of carboxylate groups, amine groups, imine groups, oxime groups, hydroxy groups, aldehydes groups, disulfide groups, thiol groups and combinations thereof.
8. The method of claim 1 further comprising the steps of i) patterning the overlayer material and the sacrificial material layer to form features; and ii) depositing a metal into the features, wherein steps i) and ii) are performed after step b) and before step c).
9. The method of claim 1 wherein the sacrificial material layer is disposed on the device substrate comprising the steps of disposing a sacrificial material composition on the device substrate and curing the sacrificial material composition to form the sacrificial material layer.
10. The method of claim 1 wherein the overlayer material has sufficient porosity to allow the sacrificial material to be removed through it.
11. An electronic device comprising a first layer comprising metal lines and a sacrificial material layer disposed between the metal lines and a second layer disposed over the metal lines and the sacrificial material; wherein the sacrificial material layer comprises a cross-linked polymer.

12. An electronic device comprising metal lines and a sacrificial material disposed between the metal lines, and an overlayer material disposed over the sacrificial material and adjacent to the metal lines.
13. The device of claim 12 wherein the overlayer material is porous.
14. A method of manufacturing an electromechanical device comprising the steps of: a) disposing a sacrificial material layer on a device substrate, b) disposing a top material layer on the sacrificial material layer, c) optionally curing the top material layer to provide desired mechanical properties, d) patterning the sacrificial material to form a desired electromechanical feature, and e) removing the sacrificial material layer.
15. The method of claim 14 wherein the sacrificial material comprises a cross-linked polymer.
16. The method of claim 14 wherein the step of patterning the sacrificial material layer is prior to step b).
17. An electronic device comprising copper lines formed on a substrate the copper lines having one or more copper diffusion barriers disposed thereon, air gaps formed between at least a portion of the copper lines and the copper diffusion barriers, and a porous overlayer material disposed over the copper diffusion barrier and the air gaps.
18. An electronic device comprising metal lines disposed on a substrate, air gaps formed between at least a portion of the metal lines, and an overlayer material, the overlayer material being disposed over the air gaps and adjacent to the metal lines.